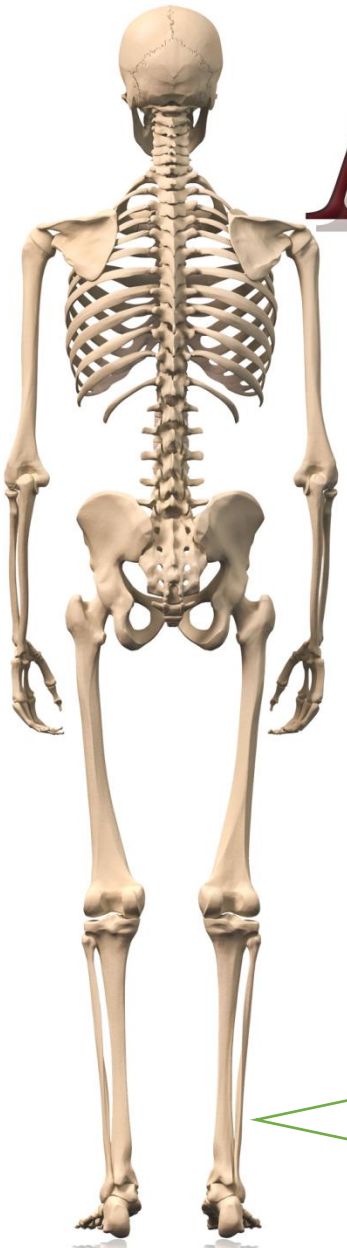
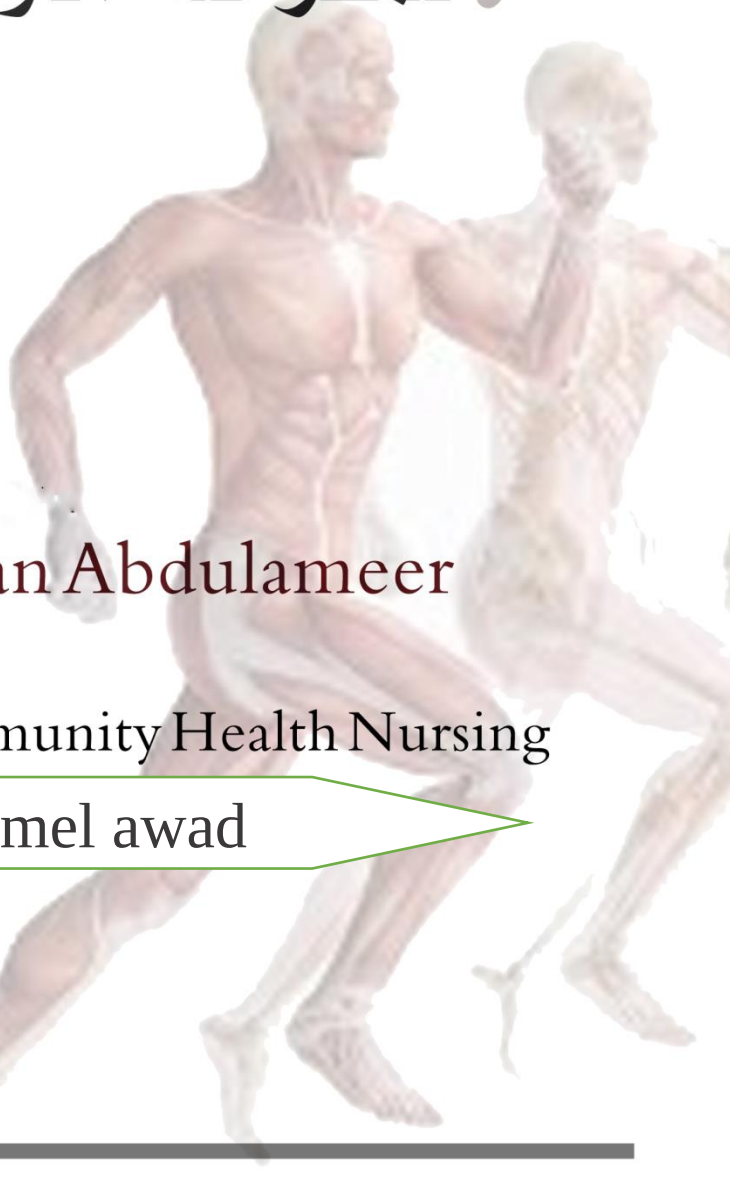
جامعة الفرات الاوسط التقنية
المعهد التقني في الديوانية
Al-Furat Al-Awsat Technical University
Al-Diwaniyah Technical Institute
قسم تقنيات التمريض/الدراسة الصباحية والمسائية



Anatomy

للمرحلة الاولى

2024-2025



Lecture

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Subject	Year of the study	Hours in week		
Anatomy تشريح	First Year	Theory	Practice	Total
		2	2	4
Week	Theory Topics			
1	-Anatomical Directions : Giving the altgram to the all directions of the human body. -Surface anatomy heart : Describe the position of the heart according to the chest wall and the number of the rib .			
2	-Surface Anatomy of lungs : Describe the position of the lungs according to the chest wall and the number of the rib . -Anatomy of the abdomen surface : We draw the regions of the abdominal surface according to the horizontally & vertically lines .			
3	-Anatomy of stomach : We demonstrate the relation of the stomach to the other organs to the abdomen . -Anatomy of Intestine : We demonstrate the relation of the Intestine to the other organs to the abdomen . -Anatomy of the Appendix : We define the region of the appendix at the right iliac region . Anatomy of the liver & spleen : We show them the regions of liver & spleen according to the surface anatomy of abdomen . -Anatomy of the gall bladder : We determine the region of gall bladder at the right sub – costal region .			

	We define the region of the uterus at the supra – pubic region .
4	**Anatomy of the skeleton : We describe the central skeleton system : Skull – vertebral column & the peripheral .** **Bones of the skull and vertebral column:** **We name the numbers of the bones on all at surfaces of the skull.** **We show the student the types of the vertebrae column and there numbers .**
5	**Anatomy of the upper limb:** **We show the bones of the shoulder on the skeleton which are the scapula and the clavicle .** **We show the bones of the arm (humerus) .**
6	**Anatomy of forearm** **We show the bones of the forearm : (ulna and radius).** **We demonstrate the bones of the hand :** **(carpal bones and meta carpal and phalanges).**
7	**Anatomy of the Lower limb:** **Bones of the pelvis :** **We define the bones of the pelvis which are :** **(Ilium and Ischium, Pubis and sacrum).** **Bones of the thigh :** **We demonstrate of the skeleton the femur bone with the lower and upper ends.**

8	**Bones of the leg :** **We show the bones which are : (Tibia & fibula)** **And extraction to the femur and the foot .** **Bones of the foot :** **We describe the bones which are :(Tarsal & metatarsal & phalanges).**
9	**Anatomy of Musculoskeletal System** **Muscle of the shoulder :** **We show them on the model all the muscles of the shoulder** **Anatomy of the chest wall :** **We give the types and numbers of the ribs and declaration of the sternum**
10	**Muscles of the chest & abdomen :** **We give the name of the muscles of the chest wall and abdominal wall .** **Muscles of the back & gluteal region :** **We show the student muscles of the back and gluteal muscles**
11	**Anatomy of the cardio-vascular system :** **We describe the anatomy and the structure of heart and the main arteries and veins around the body.**
12	**Anatomy of the digestive system :** **We show them the model of the organs of the digestive system .**
13	**Respiratory system :** **We demonstrate the lungs and bronchus and bronchi .**
14	**The urogenital system :** **We show them the kidney and urinary bladder with exaltation to the uterus & prostate .**
15	**The central nervous system :** **We describe the brain – cerebellum – medulla oblongata and the spinal cord**

Lecture 1

Anatomy: means the science of structure.

Anatomical position: the body is in an erect or standing posture with the arms of the sides and the palms for ward the head and feet are also pointing for ward.

(Meaning to the directional terms used to describe the body parts and organs).

Ex: - posterior (dorsal):- In back of.
Anterior (ventral):- In front of.

Median plain: - The plain which divide the body in to two equal half from front to back.

Direction and relative position:-

1- Medial: - to wards the medial line of the body.
2- Lateral: - to wards the side of the body.
3- Superior: - to wards the head.
4- Inferior: - to wards the feet.
5- Anterior: - in front of.
6- External: - to wards the surface of the body.
7- Proximal: - to wards the trunk.
8- Distal: - away from or farthest from the trunk.
9- Superficial: - nearer body surface.
10- Deep: - farther away from body surface.

Body regions:-

1- Axial region: head, neck, and trunk.

2- Appendicular region: upper and lower extremities

The method that used in anatomical studies:-

1- Systemic anatomy:
The study of the whole systems of the body and relation-ship between its

2- Topographic anatomy:
Division of the whole body in to the region
a- Extremities (appendicular region)
b- Head, neck, abdomen, thorax (axial region) and study all the organ of one of these parts.

3- Living or dyanmic anatomy:

Surface anatomy in the living body and topographic anatomy

4- Post-mortem anatomy: the study of the body after death

The characteristic anatomical point that used in the study of organs or parts of the body:

1- Location-site (normal)
2- Size & shape (normal)
3- Colure ((normal)
4- Relation-ship with other organ (normal)
5- Consistency (normal)

Planes or body sections:

1- Sagittal or midsagittal plane (midline)

2- Transverse or horizontal plane.

Surface anatomy:

The study of the body in general shape, like fossa or fissure ect…that can be known by eye or palpation.
(That to lead the position of internal organ)

Surface anatomy can be fixed all the parts of the body in the position to an other

Ex**: heart:** the important organ can be known the area of its on the surface of the body.
-Lungs:

Body cavities:

1- Ventral cavities:

a- Thoracic cavity
:1- medstinum- heart ,trachea ,esophagus ,and thymus gland located in mediastinum cavity.

2- Pleural cavities- right lung located in right pleural cavity , left lung in left pleural cavity.

b- Abdominal pelvic cavity.
1- Abdominal cavity: contains stomach, intestine, liver, gall bladder, pancreas and spleen.

2- Pelvic cavity: contains reproductive organs, urinary bladder, and lowest part of intestine.

2- Dorsal cavities:

a- cranial cavity contain brain.

b- Spinal cavity contains spinal cord.

Heart:

Triangular organ located in mediastinum and consist from:

1. Heart chambers .

a- Two upper chambers called atria (right, left).

b- Two lower chambers called ventricle (right , left).

c- Wall of each heart chambers composed of cardiac muscle called myocardium.

d- Endocardium – smooth muscle lining of heart chambers.

2- Covering sac or pericardium.

a- Pericardium is a two layered fibrous sac with a lubricated space between the two layers.

b- Inner layer called visceral pericardium or epicardium .

c- Outer layer called parietal pericardium.

3- Heart valves.

Four valves keep blood flowing in right direction through heart , prevent back flow (two a trio – ventricular and two semilunar valves) :

a- Tricuspid – at opining of right atrium in to ventricle.

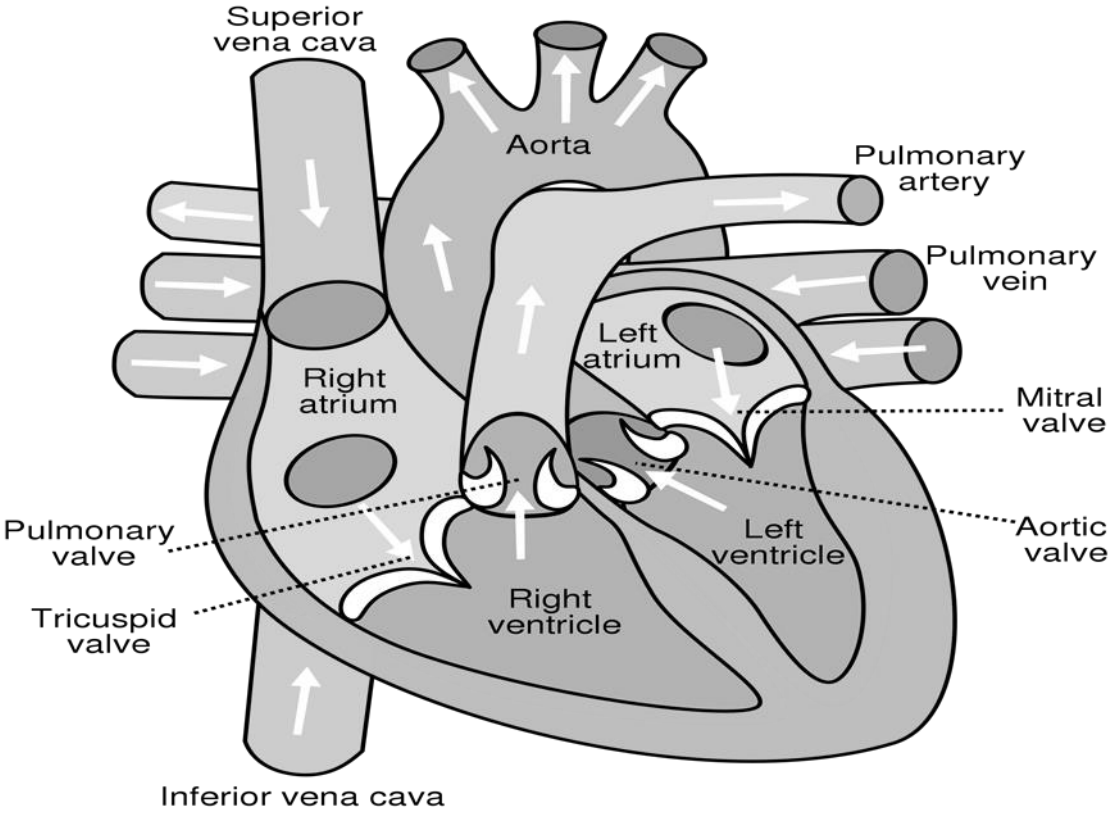
b- Mitral (bicuspid) – at opining of left atrium in to ventricle.

c- Pulmonary semilunars – at opining of pulmonary artery.

d- Aortic semilunars – at opining of aorta.

The heart is composed of outers pericardial , middle myocardial , and inner endocardial layers.

The outer pericardium has parietal and visceral layers with pericardial fluid between them. The pericardial fluid facilitates and regulates free heart contraction.



Lecture 2

Anatomy of lung

The lungs, which is the organ for respiration is a paired cone shaped organs lying in the thoracic cavity separated from each other by the heart and other structures in the mediastinum.

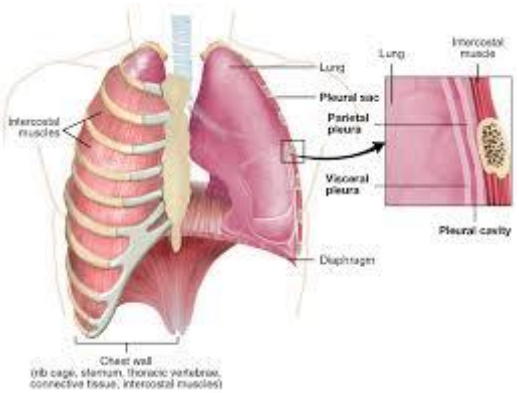
The right lung is larger and weighs more than the left lung. Since the heart tilts to the left, the left lung is smaller than the right and has an indentation called the cardiac impression to accommodate the heart. This indentation shapes the inferior and anterior parts of the superior lobe into a thin tongue-like process called the lingual.

Pleura

Each lung is invested by and enclosed in a serous pleural sac that consists of two continuous membranes.

The visceral or pulmonary pleura invest the lungs,

The parietal pleura line the pulmonary cavities and adhere to the thoracic wall, mediastinum and diaphragm.

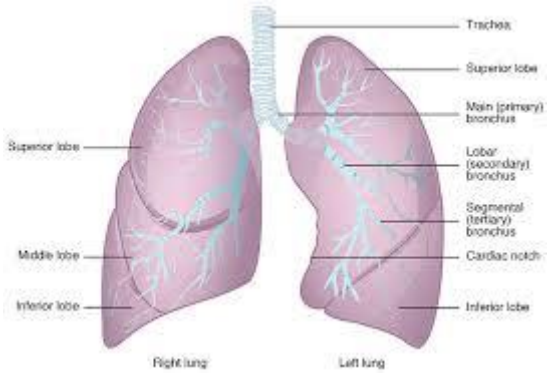


pleural cavity

The pleural cavity is the potential space between the visceral and parietal layers of the pleural and it contains a capillary layer of serous pleural fluid which lubricates the pleural surfaces and allows the layers to slide smoothly over each other during respiration. Surface tension created by the pleural cavity provides the cohesion that keeps the lung surface in contact with the thoracic wall

Lobes and Fissures of the Lungs

Each lung is divided into lobes by fissures.



Bronchial Tree

All the respiratory passages from the trachea to the respiratory bronchioles are called the tracheobronchial tree.

Defenses of the Lungs

There are a number of structures that protects the lungs from inhaled organisms and particles:

1- Nasal mucosa and hairs
2- Goblet cell and bronchial seromucous glands
3- Cilia
4- Type II pneumocytes
5- Alveoli macrophages
6- B lymphocytes
7- Polymorphonuclear leukocytes

Abdominal surface anatomy

Abdominal surface anatomy can be described when viewed from in front of the abdomen in 2 ways:

1. divided into **9 regions** by two vertical and two horizontal imaginary planes
2. divided into **4 quadrants** by single vertical and horizontal imaginary planes

These regions and quadrants are of clinical importance when examining and describing pathologies related to the abdomen

Nine abdominal regions

Horizontal planes

The dividing planes are based on lines drawn between easily palpable bony points. The horizontal planes are also of importance as they provide useful landmarks on cross-sectional imaging. The two horizontal lines are:

- **subcostal plane**
  - corresponds to a line drawn joining the lower most bony point of the rib cage, usually 10thcostal cartilage
  - body of the L3 vertebra; the origin of the inferior mesenteric artery and 3rd part of the duodenum lie on this plane
- **transtubercular plane**
  - corresponds to a line uniting the two tubercles of the iliac crests
  - upper border of the L5 vertebra and the confluence of the common iliac veins (i.e. IVCorigin) lie on this plane

Vertical planes

The two vertical planes are similar on each side and follow a line joining the mid clavicular point to the mid inguinal point. It passes just lateral to the tip of the ninth costal cartilage, which is palpable as a distinct step along the costal margin. It roughly corresponds to the lateral border of the rectus abdominis muscle.

Surface anatomy

The above lines intersect and divide the abdomen into nine regions (clockwise from the top):

- epigastric region (epigastrium)
- left hypochondrium (LHC)
- left lumbar region (left flank)
- left iliac fossa (LIF)
- suprapubic (hypogastric) region
- right iliac fossa (RIF)
- right lumbar region (right flank)
- right hypochondrium (RHC)
- and in the center, the umbilical region

Four abdominal quadrants

Horizontal plane

The dividing plane is a horizontal line drawn through the umbilicus.

Vertical plane

The vertical line is down the midline of the body, overlying the linea alba from the xiphoid to the pubic symphysis.

Surface anatomy

The above lines intersect and divide the abdomen into four quadrants (clockwise from the top):

- right upper quadrant fossa (RUQ)
- right lower quadrant fossa (RLQ)
- left lower quadrant fossa (LLQ)
- left upper quadrant fossa (LUQ)

Lecture 3

Stomach:

Normally is the stomach is a muscular, J-shaped organ in the upper part of the abdomen.

Structure

The stomach is part of the digestive system and is connected to the:

- esophagus – a tube-like organ that connects the mouth and throat to the stomach.
- small intestine (small bowel) – a long tube-like organ that extends from the stomach to the colon (large intestine or large bowel).

Regions of the stomach

The stomach is divided into 5 regions:

1- The cardia is the first part of the stomach below the esophagus. It contains the cardiac sphincter

2- Body , upper three fourth of stomach.

3- Fundus , dome like part of body of stomach.

4- Pyloric region , lower one fourth of stomach distal to the angular notch.

4- Pylorus and pyloric sphincter.

Layers of the stomach wall

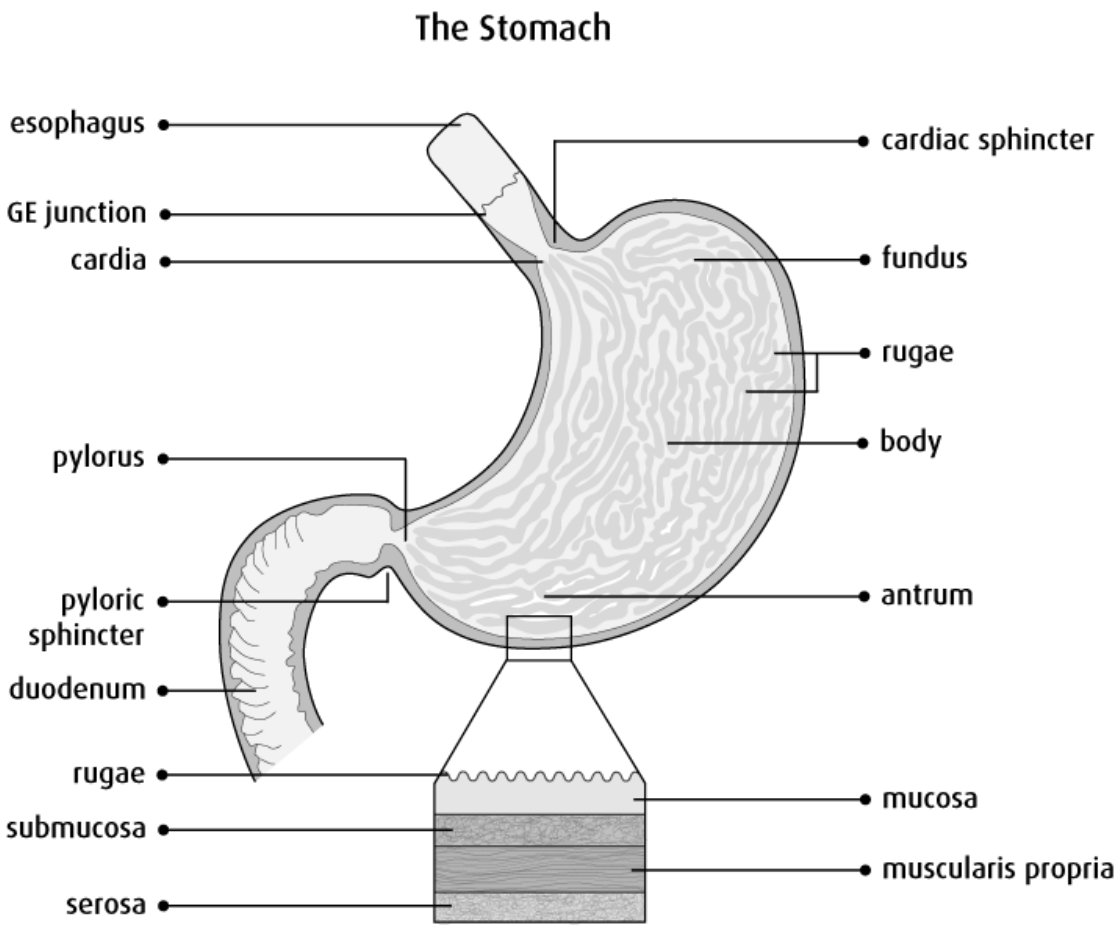
The stomach is made up of several layers of tissue:

1- The mucosa (mucous membrane) is the inner lining of the stomach.
2- The next layer that covers the mucosa is the submucosa.
3- The muscularis propria (or muscularis externa) is the next layer that covers the submucosa.
4- The serosa is the fibrous membrane that covers the outside of the stomach.

Function

The stomach has 3 main functions:

- temporary storage for food, which passes from the esophagus to the stomach where it is held for 2 hours or longer
- mixing and breakdown of food by contraction and relaxation of the muscle layers in the stomach
- digestion of food



Small intestine:

The small intestine or small bowel is the part of the gastrointestinal tract between

the stomach and the large intestine, and is where most of the end absorption of food takes place.

The small intestine has three distinct regions:

Duodenum ,first part 20-30cm long pancreas enter duodenum.

Jejunum , second part.(3-4m) long.

Ileum , third part.(3-4m) long.

Function

1- Digestion

The three major classes of nutrients that undergo digestion are proteins, lipids (fats) and carbohydrates

2- Absorption

Absorption of the majority of nutrients takes place in the jejunum, with the following notable exceptions:

- Iron is absorbed in the duodenum.
- Folate (Vitamin B9) is absorbed in the duodenum and jejunum.
- Vitamin B12 and bile salts are absorbed in the terminal ileum.
- Water is absorbed by osmosis and lipids by passive diffusion throughout the small intestine.

- Sodium bicarbonate is absorbed by active transport and glucose and amino acid co-transport
- Fructose is absorbed by facilitated diffusion.

3- Immunological.

Anatomy of the Appendix

The appendix also cecal [or caecal] is a finger-like, blind-ended tube connected to the cecum, from which it develops in the embryo.

The cecum is a pouch-like structure of the large intestine, located at the junction of the small and the large intestines.

Structure

The human appendix averages 9 cm (3.5 in) in length but can range from 5 to 35 cm (2.0 to 13.8 in). The diameter of the appendix is 6 mm (0.24 in), and more than 6 mm (0.24 in) is considered a thickened or inflamed appendix. The longest appendix ever removed was 26 cm (10 in) long. The appendix is usually located in the lower right quadrant of the abdomen, near the right hip bone. The base of the appendix is located 2 cm (0.79 in) beneath the ileocecal valve that separates the large intestine

from the small intestine.

Function

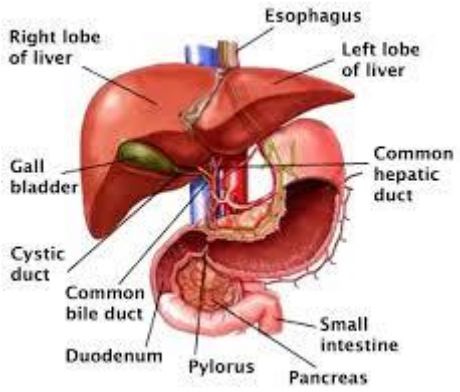
1- Maintaining gut flora.
2- Immune and lymphatic systems.

Anatomy of Liver and Spleen

The liver is a large, soft, reddish organ and the largest gland in the body. The exocrine secretion of the liver is termed bile. Many products of the hepatic cells are discharged directly into the blood stream and may be considered the endocrine secretion of the liver.

The liver lies mostly under cover of the thoracic bony cage and is covered by the diaphragm.

The liver, which is relatively large at birth, has diaphragmatic and visceral surfaces. The diaphragmatic surface, smooth and convex, is separated from the visceral surface by the sharp inferior border. The visceral surface faces inferiorward, posteriorward, and to the left.



Lobes.

The liver can be divided into right and left anatomical lobes along the left-hand limb of the "H" and by the attachment of the falciform ligament on the diaphragmatic surface.

Blood Supply

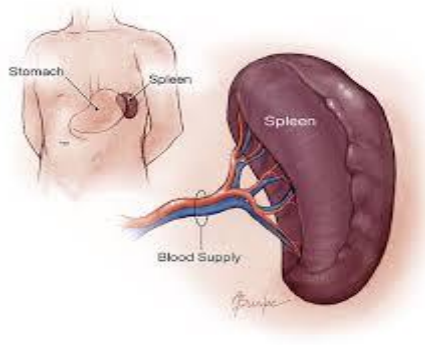
About 2/3 to 3/4 of the blood in the liver comes from the portal vein.

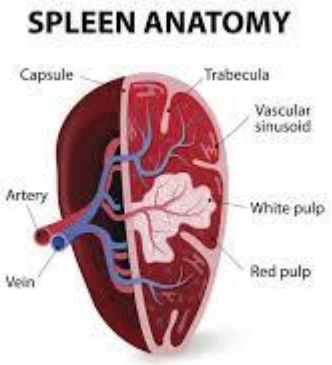
Spleen

The spleen is a soft, vascular organ surrounded by a fibrous capsule and part of the immune system. The spleen lies posterolaterally against the diaphragm and ribs 9 to 11 on the left-hand side of the body. Usually it is palpable only when enlarged.

Blood Supply.

The spleen is supplied by the splenic artery, usually a branch of the celiac trunk.





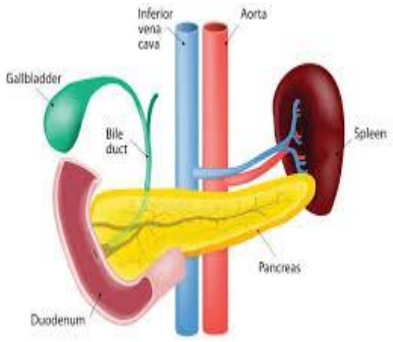
Gallbladder.

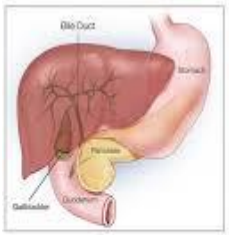
The gallbladder stores and concentrates bile. It lies in a fossa on the visceral surface of the liver, partially covered by peritoneum. The gallbladder has a fundus (at or inferior to the lower border of the liver), body, and neck, which continues as the cystic duct.

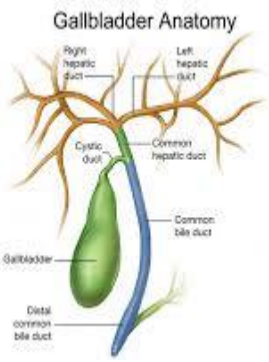
The region of the neck is frequently "S" shaped and may present an abnormal pouch, and its mucosa presents spiral folds.

The gallbladder lies between the liver, the first or second part (or both) of the duodenum, and the anterior abdominal wall.

The gallbladder is located in the angle between the right costal margin and the linea semilunaris, usually on the transpyloric plane, but it may be as low as the iliac crest. The gallbladder can be made radio-opaque (cholecystography,. Biliary constituents may crystalize and form gallstones (cholelithiasis).







Bile Duct.

The common bile duct runs in the free edge of the lesser omentum, then posterior to the first part of the duodenum and through (or at least enfolded by) the head of the pancreas, ending in the second part of the duodenum.

Lecture 4
Anatomy of the skeleton

Skull:

Is divided in to three principal parts:
1- Cranium.
2- Facial bones.
3- Mandible.

Cranium: Is the vaultike structure that encases and supports the brain ,it in turn ,is formed of eight bones.
Function : support and protects the brain.

Consist from:

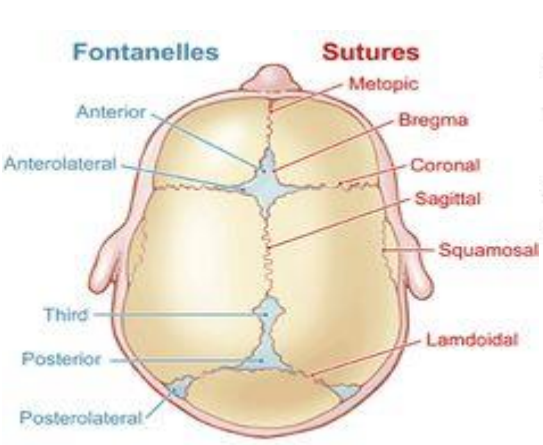
1- **Frontal bone**: located anteriorly.

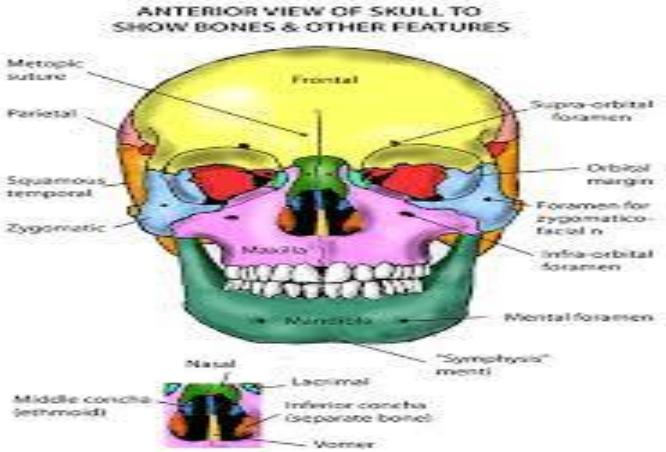
2- **Occipital bone**: located posteriorly and inferiorly.
3,4- Two parietal bones: located superiorly and anteriorly to the occipital bone

5,6- two temporal bones: located in the area of the ear on each side.

7- sphenoid bone: located anteriorly in the floor of the cranial cavity ,inferior and posterior to the frontal bone but anterior to the two temporal bones.
8- Ethmoid bone : which forms a perforated plate called the cribi form plate, lying (located) at the anterior base of the cranial cavity between the sphenoid and frontal bone.

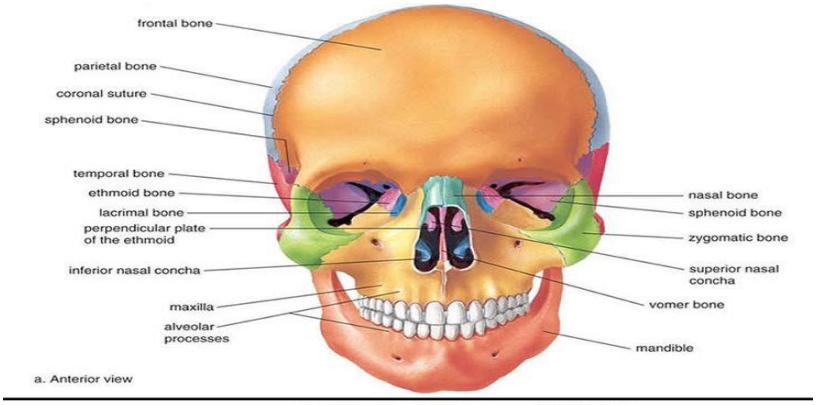
The openings of cranium:
1- Foramen magnum.
2- Hypoglossal foramen.
3- Jugular foramen.
4- Internal foramen.
5- Optic foramen.
6- Foramen ovale.
7- Foramen rotundum.
8- Foramen lacerum.
9- Carotid canal.
10- Perforation of cribiform plate.

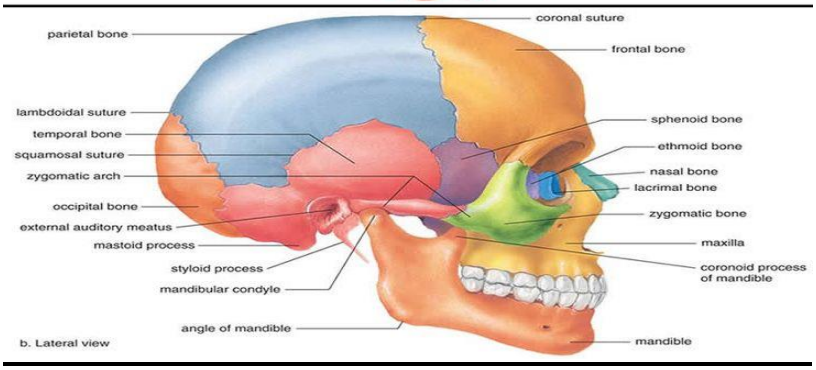


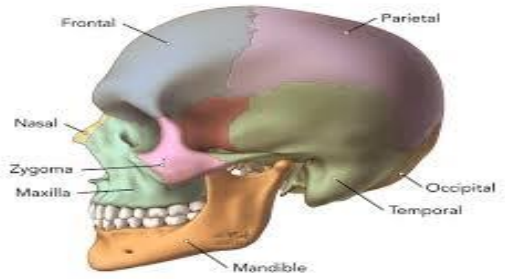


The mandible bone : (lower jaw) consist from :

1- Body : which contains the lower teeth.
2- Ramus : which passes superiorly from the body to the head.
3- Mandibular head : also called the mandibular condyle which provides the articular surface of the temporomandibular joint.
4- Coronoid processes: a large projection extending up ward from the ramns anterior to the head.
5- Mandibular foramen: large opening on the inner surface of each side of the posterior portion of the mandible.
6- Alveolar border: the superior ridge of the mandible in which the sockets for the teeth are located.







Facial bones:

1- Maxillae.
2- **Z**ygomatic bones.
3- Small paired nasal bone.
4- Very irregular and complex ethmoid bone.
5- Sphenoid bone.
6- Paired lacrimal bones.
7- Vomer.
8- Paired palatine bones.

Foramina in the facial bone.

1- Supra-orbital foramen.
2- Infra-orbital foramen.
3- Mental-foramen.

Hyoid bone is consist from :

1- Body.
2- Paired greater horns 3-4cm long, shape.
3- Paired lesser horns 1cm long.

Vertebral column: (spinal column).

Which serves as the axial support of the trunk and head , is comprised of 33 vertebrae , 7in the neck called the cervical vertebrae , 12 in the thoracic region called the thoracic vertebrae , 5 in the lower back called the lumber vertebrae and 9in the pelvic region 5of which are fused together to form the sacrum and other 4 fused to from the coccyx.

The function of vertebral column:

1- Support the weight of the body.
2- Provide a protective canal , vertebral canal (spinal cord).

The numbers of vertebrae in different parts:

1- cervical - 7 cervical vertebrae.
2- thoracic- 12 thoracic vertebrae.
3- lumbar-5 lumber vertebrae.
4- pelvic- 5 sacral vertebrae (sacrum).
- 4 coccygeal vertebrae (coccyx).

The parts of vertebrae:

1- Body : with superior and inferior articular surfaces.

2- Vertebral processes :

a- spinous.
b- transverse.

3- Articular facets :

a- superior pair.
b- inferior pair.

Special vertebral
Is characteristics by :

1- Heavy ,strong (lumbar vertebrae).

2- Light ,less strong ,more movable ,(cervical vertebrae).

3- Transverse foramen in cervical transverse processes.

The openings:

1- Vertebral foramen : form vertebral canal.

2- Inter vertebral foramen : lateral openings for spinal nerve.

The joints:

1- Between adjacent bodies.
2- Between superior and inferior articular facets.
3- Between superior facets of 1st cervical vertebrae (atlas) and the facet of occipital bone.

The regions of vertebral column:

1- Cervical region.
2- Thoracic region.
3- Lumbar region.
4- Sacral region.
5- Coccygeal region.

The vertebral curvatures :

a- Cervical curvature.
b- Thoracic curvature.
c- Lumbar curvature.
Sacral-cocyged curvature.

Lecture 5,6,7,8
Skeletal system

Bones and joint:

1- 206 individual organ (bones) found in the skeletal system.
2- The system as a whole includes not only bones but also cartilage and ligaments that together provide the body with a rigid frame work for support and protection.
3-Joints existence between bones makes the movements of body parts possible.
4- Bones also serve as storage areas for such important minerals as calcium and phosphorus.
5- The formation of blood cells in the red marrow of certain bones is another crucial function of the skeletal system.

Function:
a- support-bones from the body's supporting frame work support and gives shape to body.
b- protects-internal organs.
c- movements-helps make movement possible.
d- storage-stores calcium.
e- hemopoiesis-or blood cell formation.

Types of bone: according to general characteristic and length or shape:

1- Long bones-ex (femur).
2- Short bones-ex (tarsal).
3- Irregular bones-ex (vertebrae).
4- Flat bones-ex (scapula).
5- Pneumatic bones-ex (sinuses).

Bone: is formed by a type of cell called osteoblasts another type of cell osteoclasts continually removes old and brittle bone. This is follow by regrowth of new bone where the old has been removed continually replacing old weaker bone with new old stronger bone.

Structure of long bones:

1- Diaphysis or shaft-hallow tube made of hard compact bone.
2- Medullary cavity-the hollow area inside the diaphysis of a bone contain soft yellow bone marrow.
3- Epiphysis- the ends of the bone-red bone marrow fills in small spaces in the spongy bone composing the epiphyses.
4- Articular cartilage-a thin layer of cartilage covering each epiphysis.
5- Periosteum-a strong fibrous membrane covering a long bone except at joint surfaces where it is covered by articular cartilage.

Skeleton of the upper limb

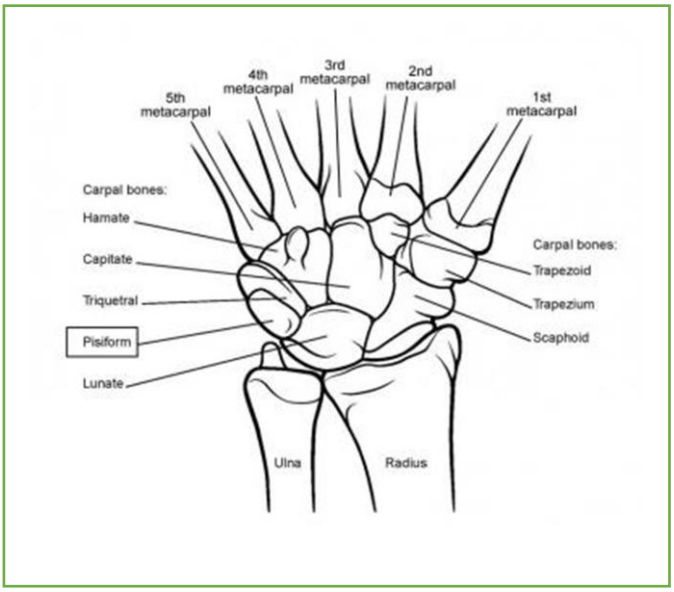
Consist from the parts:

1- Skeleton of the shoulder girdle.
a- clavicle collar bone.
b- scapula (shoulder bone) shoulder blade.

2- Skeleton of the upper arm.
a- humerus (brachial bone).
3- Skeleton of the fore arm.
a- Radius.
b- Ulna.

4- Skeleton of the hand.
a- skeleton of writs.
1- carpal bones (8bones).
b- skeleton of the palm.
1- metacarpal bones. (5bones)

c- skeleton of the fingers.
1- phalanges (14bones).



Skeleton of the lower limb

1- Skeleton of the pelvis.

Consist from the parts :

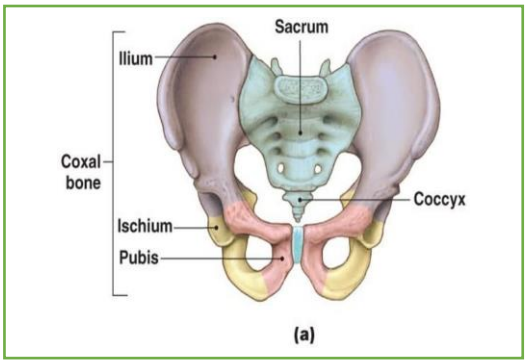
a- 2 hip bones or (2 coxal bone).

Hip bone is consist from :

1- Ilium
2- pubis
3- Ischium

b- Sacrum.

c- Coccyx .



2- Skeleton of the thigh.

a- femur.

3- Skeleton of the leg.

a- Tibia.

c- fibula.

4- Skeleton of the foot include:-

1- skeleton of the ankle:

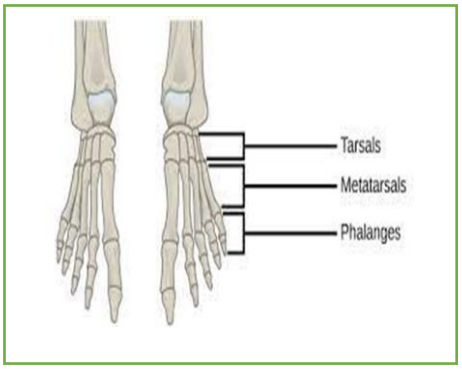
a- tarsal bones (7bone).

2- skeleton of the sole:

a- meta tarsal bones (5bone).

3- skeleton of the toes :

a- phalanges (14bone).



Lecture 9
Anatomy of Musculoskeletal System

Muscle of the shoulder

The shoulder has about eight muscles that attach to the scapula, humerus, and clavicle. These muscles form the outer shape of the shoulder and underarm. The muscles in the shoulder aid in a wide range of movement and help protect and maintain the main shoulder joint, known as the glenohumeral joint.

The largest of these shoulder muscles is the **deltoid**.

Different fibers of the muscle are responsible for different actions, including raising the arm and assisting the pectoralis muscle in the chest. One important function of the deltoid is preventing joint dislocation when a person carries heavy objects.

Four muscles—the **supraspinatus**, **infraspinatus**, **teres minor**, and **subscapularis**—make up the **rotator cuff**. It stabilizes the shoulder and holds the head of the humerus into the glenoid cavity to maintain the principal shoulder joint.

The muscle of upper arm:

- Biceps muscle.
- Brachialis muscle.
- Triceps muscle.

Anatomy of the chest wall

The chest wall is comprised of skin, fat, muscles, and the thoracic skeleton. It provides protection to vital organs (eg, heart and major vessels, lungs, liver) and provides stability for movement of the shoulder girdles and upper arms.

Ribs

Twelve pairs of ribs the sternum breast bone and the thoracic vertebrae form the bony cage know as the thorax or chest.

1- Each of 12 pairs of ribs attaches posteriorly to a vertebrae .
2- All ribs except the lower two pairs attach to the sternum .
3- First seven pairs of ribs (true ribs) attach to the sternum by means of costal cartilage.
4- The eight ,ninth ,and ten the pairs of ribs attach to the cartilage of the seventh ribs and are some times called false ribs.
5- The last two pairs of ribs in contrast do not attach to any costal cartilage but seem to float free in front hence their descriptive name floating ribs.

Sternum is consist from :

1- Manbrium: articulates with clavicle and first two ribs and fibrous ,joint with body of sternum .

2- Body : articulate with ribs 2-10 by costal cartilages and costal arch.

3- Xiphoid bone : fibrous joint with body.

Ribs : 12 pairs.

a- Two joints allow rotation one with vertebral bodies one with transverse process.

b- Ten ribs attach by costal cartilages to sternum 7(directly) 3 by way of costal arch (indirectly).

c- Ribs 11 and 12 have no anterior attachments called (floating ribs).

Lecture 10

Muscles of the chest & abdomen

Muscular system:

The muscular system consist of mor than 500 muscles that move us a bout in many way.

The type of muscles:

1- Striated muscle , skeletal , voluntary.

2- Cardiac muscle , myocardium , striated , in voluntary.

3- Non – striated muscle , smooth , visceral or involuntary , plain , deep , found in

The skeletal muscles:

Structure :

1- Striated cells (fibers) and connective tissue.

2- Most muscle extend from one bone a cross movable joint to another bone.

3-The parts of a skeletal muscle:
- a- origin : the attach ment of the muscle to the bone that does not move.
- b- Insertion : the attachment to the bone that does move.
- c- Body: main part of muscle (muscle belly)

4- Muscles attach to bones by tendons.

5- Muscle have different size , length.
- Very long example : muscles of thigh (half).
- Short example : intercostals muscle (1-2cm).
- Shape – fusi form in shape (cigar – shape).

The function of skeletal muscles:

1- Flexion : making angle at joint smaller .

2- Extension : making angle at joint large.

3- Abduction : moving apart away from mid line.

4- Adduction : moving apart to ward mid line.

The moneclature of muscles:

According to:

1- Function : ex flexor or extension muscle.

2- Shape : ex tripizus muscle.

3- Position : ex inter costal muscle or frontalis.

4- Junction : ex radio-ulnaris muscle.

5-Mixed : ex flexo-radio-ulnaris muscle.

The muscles of the hand and face:

1- Muscles of expression :

a- Muscles of scalp:

- occpito frontals muscle.

b- Muscle of face:

- -Platysma muscle.
- -Buccinator muscle.
- -Orbicularis oris muscle.
- -Orbicularis occuli muscle.

2- Muscle of mastication :

- Temporalis muscle.
- Masseter muscle.

3- External muscles of the eye ball.

1- Recti muscles:

a- Superior rectus.

b- Inferior rectus.

c- Medial rectus.

d- Lateral rectus.

2- Oblique muscles:

a- Superior oblique.

b- Inferior oblique.

The muscle of the neck:

- Platysma muscle.
- Yrapizius muscle.

The muscle of back:

- Latissimus dorsi muscle.

The thoracic muscles:

a- Superficial group.

1. pectoralis major muscle.
2. pectoralis minor muscle.
3. serratus anterior muscle.

b- Deep group :respiratory muscle.

1- internal muscle
- internal
- External

2- Diaphragm.

The abdominal muscles:

1- Rectus abdominis muscle.

2- External oblique muscle.

3- internal oblique muscle.

4- Transversus abdominis muscle.

5- Pyramidalis muscle.

The muscle of upper arm:

- Biceps muscle.
- Brachialis muscle.
- Triceps muscle.

The muscle of the thigh:

- Quadriceps femoris.
- Biceps femoris.

The muscle of leg:

- Tibialis anterior

- Tibialis posterior.

Muscles of the back & gluteal region

The Muscles Of The Back

Extrinsic muscles **Intrinsic muscles**

1- superficial group. 3-deep group
2-intermediate group

✓ **Superficial group** called the **appendicular group**

1- Trapezius
2- Latissimus Dorsi
3- Levator Scapulae
4- Rhomboid Major
5- Rhomboid Minor

✓ **Intermediate Group Of Back Muscles**

1- Serratus posterior superior
2- Serratus posterior inferior

✓ **Deep Group Of Back Muscles**

1. The extensors and rotators of the head and neck: the splenius capitis and cervicis (**spinotransversales muscles**).
2. The extensors and rotators of the vertebral column: the **erector spinae** and **transversospinales**. and
3. The short **segmental muscles**: the interspinales and intertransversarii.

The vascular supply to this deep group of muscles is through branches **arteries** like:

- Vertebral
- Deep cervical
- Occipital
- Transverse cervical
- Posterior intercostal
- Subcostal
- Lumbar
- Lateral sacral arteries

❖**Spinotransversales Muscles**

1- The **splenius capitis** is a broad muscle attached to the occipital bone and mastoid process of the temporal bone.

2- The **splenius cervicis** is a narrow muscle attached to the transverse processes of the upper cervical vertebrae.

❖**Erector Spinae Muscles**:

1- Iliocostalis Lumborum
2- Iliocostalis Thoracis
3- Iliocostalis Cervicis
4- Longissimus Thoracis
5- Longissimus Cervicis
6- Longissimus Capitis
7- Spinalis Thoracis
8- Spinalis Cervicis
9- Spinalis Capitis:-

Semispinalis:

1- Semispinalis Thoracis
2-Semispinalis Cervicis
3-Semispinalis Capitis

-Multifidus

-Rotatores :

1- Rotatores Lumborum
2- Rotatores Thoracis
3- Rotatores Cervicis

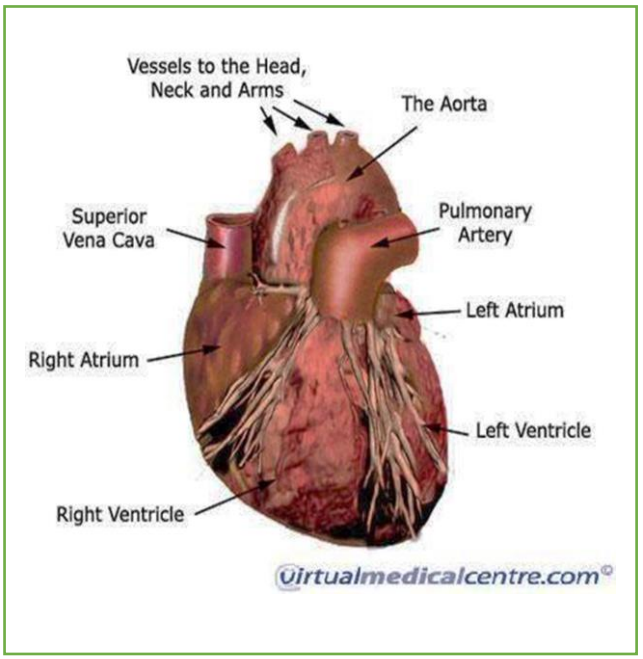
❖**Segmental Muscles:**

1- Levatores Costarum
2- Interspinales
3- Intertransversarii

Lecture 11

Anatomy of the cardio-vascular system

Circulation system:



Consist from two system:

1- **Cardio – vascular system.**

2- Lymphatic system.

Cardio – vascular system: is consist from:

1- Blood vessels.

2- Heart.

In general the blood vessels divided in to :

1- Arteries : carry blood away from the heart to ward capillaries , the large artery in the body is the aorta.

2- Veins : carry blood to ward the heart away from capillaries , the large vein in the body is: a- superior vena cava b- inferior vena cava.

3- Capillaries : carry blood from tiny arteries or arterioles in to tiny , veins or venules.

The structure of blood vessels:

Arteries , veins , and capillaries differ in structure.

Three coats or layers are found in both arteries and veins.

a- Tunica external: the outer most layer or coat (fibrousT.).

b- Tunica media: muscular tissue is found thicker in artery than its found in vein. Plays a critical role in the main taining blood pressure, this is smooth muscle and elastic fibers, that controlled by autonomic nervous system.

c- Tunica internal: a thin layers of elastic and white fibrous tissue covers an inner layer of endothelial cells in artery and veins, the tunica internal is actually a singlelayer of endothelial cells that lines surface of these vessels. Is not found in capillaries because they are microscopic vessels.

Capillaries: the structure of its :

1- Only one layer of flat endothelial like cells compose the capillary membrane.

2- Instead of three layer is composed of only tunica internal.

The types of arteries:

1- Elastic arteries : large diameter & elastic wall , low muscle
T.ex : aorta.
There function :-

- Reduce pulse pressure is systolic and diastolic blood pressure.

2- Muscular arteries :moderate diameter & large amount of muscle
T.ex : coronary artery , visceral arteries , radial artery.

3- Arterioles : below of 100 micron in diameter.

The type of capillaries :

1- Fenestrated capillaries.

2- Continuous capillaries.
Transport of food from diffusion or phagocytosis or pinocyto.

The veins :

1- Thin layer of wall.
2- Thin muscular layer.
3- Decrease elastic fiber.
4- Has valve.

a- veins.

b- venules.

Median cubital :

The main veins in the body :
1- Superior vena cava.
3- Inferior vena cava.

The aorta artery : Divided in two parts

1- <u>Thoracic aorta ,</u> consist of :

a- Ascending aorta : right and left coronary arteries supplied heart muscle.

b- Aortic arch :
1- Brachio cephalic artery.
a. Right common carotid artery.
* External carotid artery: the supplied superior thyroidal , facial , occipital , maxillary , middle meningeal , superficial temporal.

* Internal carotid artery : ophthalmic , middle cerebral , anterior cerebral

b. Right sub clavian artery:
1- Axillary artery.
2- Vertebral artery.

2- Left common carotid artery.

3- Left sub clavian artery : axillary , brachial , radial and ulnar artery.

2- **<u>Abdominal aorta.</u>**

1- Coeliac artery: gastric a. , spleenic a. , hepatic a. , pancreatic a.

2- Superior mesenteric artery.

3- Inferior mesenteric artery.

4- Right renal artery.

5- Left renal artery.

6- Common iliac arteries:
a- Internal iliac artery, uterine artery.
b- External iliac artery.
Femoral artery.
Politeal artery:
1-Anterior tibial artery.2- Posterior tibial artery

Lymphatic system.

Is consist from:

1- Lymph glands or lymph nodes : oval , ellipsoid , kidney – like shape organ (1-105cm) length, located mainly in clusters along lymphatic's vessels.

Function :

1- Defense.
2- White blood cell formation.

Structure of L.G :

1- Fibrous capsule.
2- Trabeculi.
3- Reticular tissue.
4- Masses of lymphocytes.

The types of lymph glands:

a- Superficial lymph glands:

1- Cervical group.
2- Axillary group.
3- Inguinal group.

b- Deep lymph glands:

1- Iliac group.
2- Lumber group.
3- Thoracic group.
4- Mesenteric group.
5- Portal group.

2- Lymphatic vessels.

Lymph drainage from the :

a- Right lymphatic duct : drainage lymph from the upper right quarter of the body in to the right sub clavian vein.

b- Thoracic duct : drainage lymph from all the rest of the body in to the left sub clavian vein.

3- Lymphatic tissue.

1- Tonsils.

2- Adenoids.

3- Spleen.

4- Payers patches.

5- Lymphatic tissue : appendix.

Lecture 12

Anatomy of the digestive system

Digestive system:

Is called alimentary canal or digestive tract
The digestive system begins with the mouth and extends through the pharynx, esophagus, stomach, small intestine, (duodenum , jejunum, ilium), large intestine (cecum , colon , rectum , and anus).

The accessory organs of mouth include.

1- Salivary glands.

That secretes the saliva in duct to the mouth cavity.

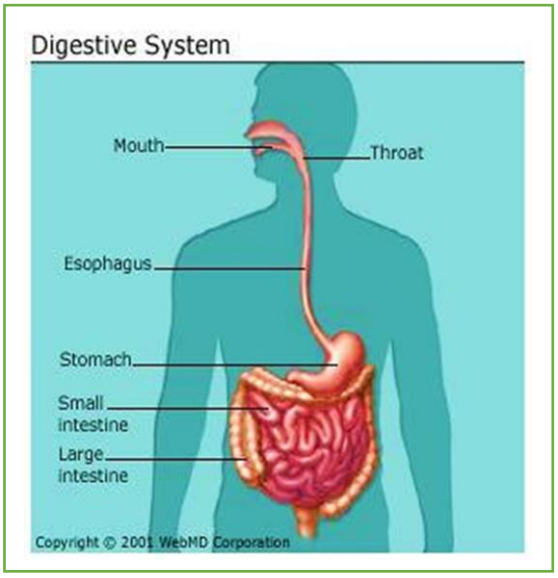
a- Parotid salivary gland

b- Sub mandibular salivary gland.

c- Sub lingual salivary gland.

2- Teeth:
- Incisors.
- Connie.
- Premolar.
- Molar.

3- Tongue.



The accessory organs of intestine

1- Liver.
2- Pancreas.

Mouth:

1- Hard palate, anterior two third of root oh mouth.
2- Soft palate, posterior of root of mouth.
3- Tongue papillae, anterior two third of tongue.
4- Pharynx.
Naso – pharynx . above soft palate and posterior to nasal cavities.

Oro – pharynx . posterior to mouth.

Laryngeo pharynx . posterior to larynx and root of tongue.

Esophagus:

Extends from pharynx to cardiac orifice of stomach 25cm in length.

Stomach:

Normally is j – shaped structure.
1- Body , upper three fourth of stomach.

2- Fundus , dome like part of body of stomach.

3- Pyloric region , lower one fourth of stomach distal to the angular notch.

4- Pylorus and pyloric sphincter.

Opening from stomach in to duodenum and thickened circular muscle sphincter around opening the control stomach emptying.

Small intestine:

Duodenum , first part 20-30cm long pancreas enter duodenum.

Jejunum , second part.(3-4m) long.

Ileum , third part.(3-4m) long.

Large intestine: absorbs most remaining fluid and electrolyte.

Cecum , bulbous pouch (blind extended).

Ascending colon , along right abdominal cavity wall.

Transverse colon , crosses under liver and stomach.

Descending colon , along left abdominal cavity wall.

Sigmoid colon , tortuous connecting link from descending colon to rectum.

Rectum , pelvic end of large intestine from which feces are defecated.

Anal canal , opening through which feces are defecated.
Internal anal sphincter , thickened circular smooth muscle around anal canal.

Lecture 13

Respiratory system

1- Upper respiratory passages (tract) includes:

a- Nasal cavities

b- Larynx.

2- Lower respiratory passages:

a- Trachea.

b- Lungs.

Nasal cavity:

a- Nasal septum : separates interior nose in two nasal cavities.

b- Mucous membrane lines of nasal cavities , ciliated columnar epithelia and highly vascular.

c- Frontal sinuses ,maxillary sinuses ,sphenoidal sinuses and ethmoid sinuses drainage in tonose.

2- Pharynx:

a- Pharynx (throat) about 12.5cm (5inches) long

b- Divided in to:
1- naso pharynx.
2- Oro pharynx.
3- Laryngo pharynx.

c- Two nasal cavities , mouth , esophagus , larynx , and Eustachian all have openings in to pharynx.

d- Adenoids and opening of eustachian tubes open in to naso pharynx , tonsils found in oro pharynx.

e- Mucous membrane lines pharynx.

Larynx:

1- Several pieces of cartilage from farme – work:
a- thyroid cartilage
b- Epiglottis partially covers opening in to larynx.

2- Mucous lining.

3- Vocal cords stretch a cross interior of larynx.

Trachea:

1- Tube about 11cm long that extends from larynx in to the thoracic cavity.

2- Mucous lining.

3- C – shaped rings of cartilage hold trachea.

Bronchi, bronchioles and alveoli:

1- Trachea branches in to right and left bronchi.

2- Each bronchus branches in to smaller and smaller tubes called bronchioles.

3- Bronchioles and in clusters of microscopic alveolar sac the walls of which are made up of alveoli:

Lungs and pleura:

1- Size – large enough to fill chest cavity except for middle space occupied by heart & large blood vessels.

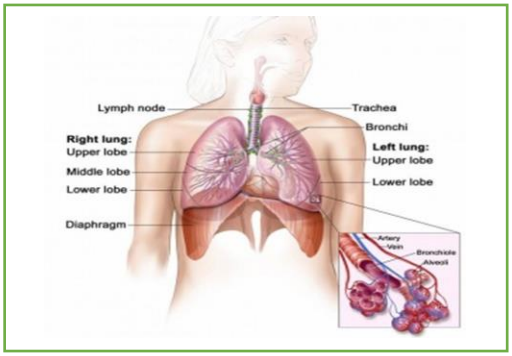
2- Apex – narrow upper part of each lung, under collar bone.

3- Base – broad lower part of each lung rests on diaphragm.

4- Pleura – moist, smooth, slippery membrane that lines chest cavity and covers outer surface of lungs prevents friction between lungs and chest wall during breathing.

Tracheostomy:

In case complete block of trachea.

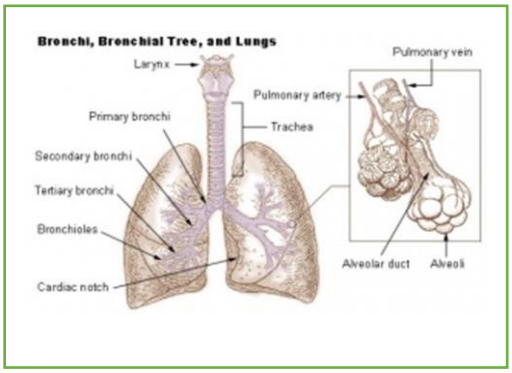


Lung hilum:

1- Bronchus.

2- Pulmonary artery.

3- Pulmonary vein.



Pleural membrane:

1- Visceral pleura.

2- Parietal pleura.

Hydro thorax:

Accumulation of fluid in thoracic cavity treatment (pleura effusion).

Dead space include

1- Trachea.

2- Bronchus.

3- Bronchiole.

4- Terminal bronchiole.

Lung unit include

1- Respiratory bronchioles.
2- Alveolar ducts.
3- Alveoli.

Lecture 14

The urogenital system

Urinary system.

Is excretory system of the body like (intestine, skin , respiratory system).

Is composed from :
1- Kidneys

2- Ureters.

3- Bladder.

4- Urethra.

The kidney : bean like dark red organ. Located on the posterior abdominal wall on the each side of vertebral coloumn, on 3 lumber vertebrae, long 11cm diameter 6cm weight.

1- capsule , strong fibrous covering of kidney.

2- Hilum , medial entry area to kidney of renal artery , renal vein , lymphatic , nervous and urethral system.

3- Cortex , outer portion of renal tissue containing the renal corpuscles , the proximal tubules , the distal tubules and outer portion of the loops of henle and collecting ducts.

4- Medulla , inner portion of renal tissue containing inner portion of the loops henle and the collecting ducts.

5- Papilla , inner most portion of medulla in form of inverted cones pro in to minor calyces through which the collecting ducts empty.

6- Urinary out flow tract.

a- Minor calyces collects urine from collecting ducts in papillae.

b- Major calyces, collect urine from 2 or more minor calyces.

c- Renal pelvis , collects urine from 4 to 8 major calyces.

d- Ureter , conducts urine from renal pelvis to urinary bladder.

The nephron:

Small anatomical and functional unite of kidney, l million nephron of each kidney.

a- **Renal corpuscle, malpigian body,**

1- Glomerulus , tuft of glomerular capillaries , coverd by epithelial cells ,through which glomerular filtrate filters.

2- Bowman's capsule , collecting chamber for glomerular filtrate.

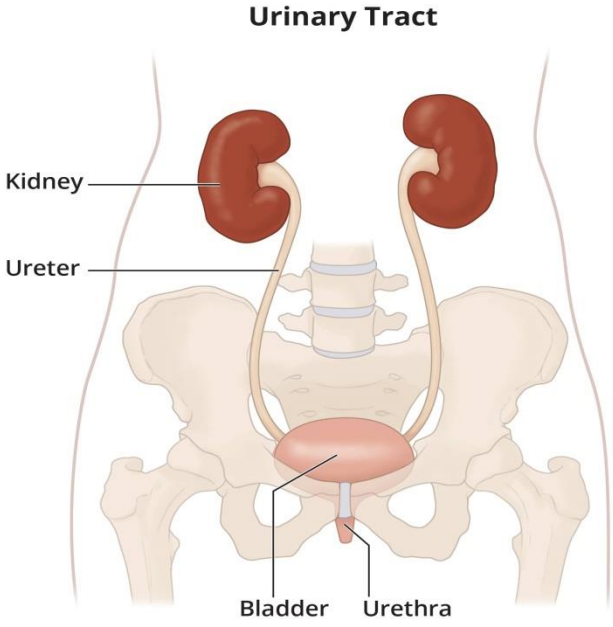
b- **Renal tubules:**

1- Proximal tubule , located in renal cortex , most of it convoluted , conducts , fluid from bowman's capsule.

2- Loop of henle , long tubular loop that conducts tubular fluid from proximal tubule in to cortex.

3- Distal tubule , located in cortex , most of it convoluted , conduct fluid from loop of henle.

4- Collecting duct , conduct fluid from D.T through medulla to renal minor calyces.



Reproductive system.

Males organs of generation :

a- Primary sex organs.

Those producing male and female gametes.

In male are a pair of tests producing spematoza (male gametes) & secrete male hormones.

While in females are a pair of ovaries producing ovum (female gametes) & secrete female hormones.

b- Secondary (accessory) sex organ.

Those concerned with carriage of gametes and other function , in female uterus for example are associated with menstrual cycle , maintenance of pregnancy and parturition.

In male includes :

pelvic part epididymis , vas deferens, seminal ,

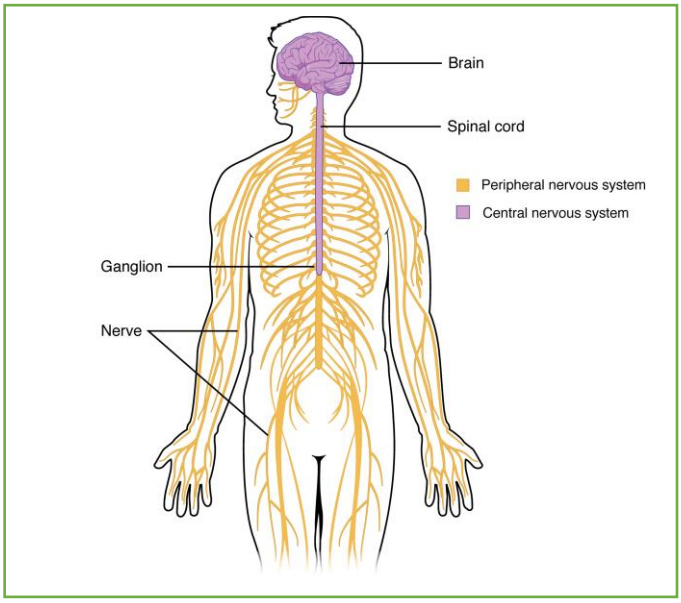
prineal part , vesicles , prostate, Cowper's gland, urethra and penis.
penal part , vesicles , prostate, Cowper's gland, urethra and penis.

In females includes:

Uterus with fallopian tubes at upper lateral ends and cervix at lower end , vagina , bratholian glands , clitoris , labia minor and labia majora & mammary glands.

Nipple.
Areola.

Lecture 15



Nervous system.

Is divided in two parts :

1- Somatic nervous system:

a- Central nervous system.
b- Peripheral nervous system.

2- Autonomic nervous system:

a- Sympathetic nervous system.
b- Parasympathetic nervous system.

The central nervous system is composed from:

1- Brain.

2- Spinal cord.

The meninges: is the serous membrane covered the brain and the spinal cord , its three types.

The types of meninges :

1- Dura mater – outer layer.

2- Arachnoid mater – middle layer.

3- Pia mater – inner layer.

The cerebro-spinal fluid secretion from the meninges its serous fluid for nutrition and immunity of brain & spinal cord.

The lumber puncture of c.s.f from 3-4 lumber vertebrae for the diagnosis of meningitis.

The brain: is the main part of C.N.S found in the cranial cavity , is divided in to :

1- Cerebrum.
2- Cerebellum.
3- Brain stem :
   a- mid brain.
   b- Pons.
   c- medulla oblongata.

The cerebrum :the large part of brain (hemispheres) and in divided for 4 lobs:

1- Frontal lobe.

2- Parietal lobe.

3- Occipital lobe.

4- Temporal lobe.

The cross section of cerebrum , two layer :

1- **Cerebral cortex** :outer layer gray matter contain nervous cell that act the central function of the following :

a- Motor area (4-6).

b- Sensory area (3,1,2).

c- Visual area (17) central blindness.

d- Auditory area (40,41).

e- Olfactory area.

2- **White mater** : the inner layer of cerebrum contain:

a- Basal ganglia.

b- Thalamus.

c- Hypothalamus.

Is the group of accumulation of ganglia, the function of its for :

1- Secretion hormone for regulation of :

a- Kidney.
b- Muscle.
c- Pituitary gland.

2- regulation of autonomic nervous system.

3- Regulation of temperature.

4- Regulation of appetite.

The ventricles of the brain :

1- Left lateral ventricle.

2- Right lateral ventricle.

3- Third lateral ventricle.

4- Forth lateral ventricle.

The spinal cord :

The part of C.N.S found in the spinal canal long 30 cm .

The peripheral nervous system :

1. Cranial nerves . (12 pairs) originated form brain .
2. Spinal nerves . originated from spinal cord (31 pairs) .

Cranial nerves: originated from brain stem (medulla oblongata) except the first cranial nerve originated from olfactory lobe.

The function:

1- Sensory.

2- Motor.

3- Mixed.

1- **Olfactory nerve**: is sensory nerve originated from 20 nerve olfactory lobe.

2- **Optic nerve :** sensory.

3- **Oculomotor nerve** : motor.

4- **Trochlear nerve :** motor , superior oblique.

5- **Trigeminal nerve**: mixed nerve.

- Ophthalmic nerve : sensory.
- Maxillary nerve: sensory.
- Infra orbital nerve.
- Mandibular nerve: mixed.

6- Abducent nerve.
7- Facial nerve : mixed.
8- Auditory nerve : sensory.
9- Glosso – pharyngeal nerve : mixed.

10- Vagus nerve : mixed, pharynx ,trachea, lungs, heart, esophagus, stomach, upper part of intestine, duodenum.
11- Accessory nerve : motor , for larynx & pharynx.
12- **Hypoglossal nerve:** motor.

The spinal nerves:

1- Cervical spinal nerves.(8 nerves).

2- Thoracic spinal nerves.(12 nerve)

3- Lumber spinal nerves.(5 nerves)

4- Sacral spinal nerves.(5 nerves).

5- Coccygeal spinal nerves.

The spinal nerve : originated from spinal cord from :

1- Anterior root (motor).

2- Posterior root (sensory).

The nerve trunk mixed contain:

1- Ventral ramus.

2- Dorsal ramus.

The nerve plexuses:

1- Cervical plexuses. Neck & skin.

2- Brachial plexuses:

a- Axillary nerve.
b- Radial nerve.
c- Ulnar nerve.
d- Median nerve.

3- Lumbo- sacral plexuses:
a- Femoral nerve.
b- Obturator nerve.
c- Sciatic nerve:
1- lateral popliteal nerve (common peroneal nerve).
2- Medial popliteal nerve (tibial nerve).

Autonomic nervous system: two parts

1- Sympathetic nervous system.

2- Parasympathetic nervous system.

Is consist from 3 parts:

1- Autonomic ganglia.

2- Autonomic nerve fiber.

3- Autonomic plexuses.

The type of sympathetic ganglia :

1- Cervical sympathetic ganglia (3 ganglia).

2- Thoracic sympathetic (11 or 12).

3- Lumbar sympathetic (4 ganglia).

4- Sacral sympathetic (4 or 5).

The type of plexuses of autonomic nervous system:

1- Cardiac plexuses.

2- Coeliac plexuses.

3- Hypo gastric plexuses.

The different between sympathetic and parasympathetic nervous system:

Sympathetic	***Parasympathetic***
1- Origin : Spinal from T1 to L3.	1- cranial part: a- ocluomotor nerve. b- facial nerve. c- glasso pharyngeal nerve. d- vagus nerve. 2- sacral part s2-s4.
2- Ganglia: Near the spinal cord and arrange like chain.	away from spinal cord and lie near the organ (internal organ).
3- Nerve fiber: a- pre ganglionic fiber is short. b- post ganglionic fiber is long.	a- pre ganglionic fiber is long. b- post ganglionic is short.
4- Chemical secretion : 1- Adrenaline.	1- Acetyl choline.